

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listing, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended): A system for data mining from one or more data sources comprising:

a source of data comprising one or more domains of information;

an Object-Relationship Database comprising data objects from the one or more domains of information, wherein each data object ~~comprises~~ consists of a noun, a verb, an adjective, an adverb, a phrase, a sentence, a symbol or a numeric character;

a processor linked to the Object-Relationship Database, wherein the processor executes a knowledge discovery engine where relationships between two or more ~~integrated~~ data objects within the Object-Relationship Database are: (a) identified as a direct relationship or an indirect relationship, (b) retrieved, (c) grouped into categories selected from the group consisting of a positive effect, a negative effect, a physical association and a logical association, (d) ranked based on a relative strength of the identified relationship, (e) filtered by lexical processing and (f) numerically evaluated to identify previously unknown relationships between an object query and the data objects using an average observed-to-expected ratio ~~where no link previously existed~~; and

a user interface linked to the processor.

Claim 2 (original): The system of claim 1, wherein the source is one or more databases containing textual information.

Claim 3 (original): The system of claim 1, wherein the source is one or more databases containing numerical information.

Claims 4-6 (canceled)

Claim 7 (original): The system of claim 1, wherein the domains of information comprise parcels of data as information as text, symbol, numerals and combinations thereof.

Claim 8 (original): The system of claim 1, wherein the system is at least partially automated.

Claim 9 (canceled)

Claim 10 (original): The system of claim 1, wherein the Object-Relationship Database (ORD) is created using a method comprising the steps of:

- compiling one or more data source objects;
- adding the synonyms of the data source objects; and
- grouping the information in the one or more data source into an object-relationship database.

Claim 11 (previously presented): The system of claim 10, further comprising the step of constructing a database of lexical variants from a data source.

Claim 12 (previously presented): The system of claim 11, wherein the system further comprises a program for scanning the object-relationship database with the database of lexical variants to add synonyms.

Claim 13 (original): The system of claim 12, wherein the system comprises a program for checking the object-relationship database for errors.

Claim 14 (previously presented): The system of claim 10, wherein the ORD creation method further comprises the step of increasing processing efficiency by assigning each database data object a unique numeric ID and storing adirectional relationships by lowest ID first.

Claim 15 (previously presented): The system of claim 1, wherein the data object is retrieved from unstructured text, structured data, a list, a table, a phrase, a paragraph, an abstract, a program, a manual, a text book, a reference book, treatise, a lab notebook, a letter, a memo, an email, a table of contents, index, a magazine, an article, scientific literature, a patent, a patent

application, an international application, a webpage, a spreadsheet, a URL, or relational database, and combinations thereof.

Claim 16 (previously presented): The system of claim 15, wherein the data object is selected from the group consisting of gene, protein, chemical compound, small molecule, drugs, diseases, clinical phenotype, and other identifiers selected from the group consisting of ChemID, MeSH, FDA, locuslink, GDB, HGNC, MeSH, Medline, Snowmed, and OMIM.

Claim 17 (original): The system of claim 10, wherein the ORD creation method further comprises the step of screening out common words.

Claim 18 (previously presented): The system of claim 10, wherein the ORD creation method further comprises the step of identifying capitalizations and patterns for words by accessing a word database.

Claim 19 (previously presented): The system of claim 11, wherein the data source comprises a synonym database.

Claim 20 (previously presented): The system of claim 11, wherein the step of constructing the database of lexical variants further comprises using an acronym-resolving algorithm.

Claim 21 (previously presented): The system of claim 1, wherein the user interface comprises a graphical user interface for displaying one or more data objects.

Claim 22 (previously presented): The system of claim 21, wherein the graphical user interface comprises a control element, which can be clicked to display the integrated data object derived from the context of the source data.

Claim 23 (previously presented): The system of claim 1, wherein a portion of the Object-Relationship Database is constructed using a method comprising the steps of:

- inputting a block of text from the source of data;
- extracting information from the source to create a record; and

creating one or more arrays to match words in the record against phrases in the object-relationship database.

Claim 24 (original): The system of claim 23, wherein the method further comprises resolving acronyms.

Claim 25 (original): The system of claim 23 or 24, wherein the method further comprises parsing the record into sentences and parsing each sentence into words.

Claim 26 (previously presented): The system of claim 23, wherein the information extracted from the source comprises title, abstract, date, and PMID fields.

Claim 27 (previously presented): The system of claim 23, wherein the block of text is selected from the group consisting of a list, a table, a phrase, a paragraph, an abstract, a program, a manual, a text book, a reference book, a lab notebook, a letter, a memo, an email, a table of contents, a magazine, an article, scientific literature, a patent, a patent application, an international application, a webpage, a spreadsheet, a URL, or relational database, and combinations thereof.

Claim 28 (original): The system of claim 27, wherein the block of text is selected from the Physician's Desk Reference.

Claim 29 (original): The system of claim 23, wherein the block of text is given a higher value if the source of the information is considered to have a higher impact than other like sources according to selected criteria for impact.

Claim 30 (withdrawn): A system for relating objects comprising:

an object-relationship database generated from a data source comprising one or more domains of information; and

a knowledge discovery engine that recognizes relationships between objects in a data source, wherein the knowledge discovery engine identifies a one or more cooccurrences of objects within the data source, and identifies implicit relationships between the objects.

Claim 31 (withdrawn): The system of claim 30, wherein the knowledge discovery engine generates a comprehensive network of relationships.

Claim 32 (withdrawn): The system of claim 31, wherein the knowledge discovery network generates a partial network of relationships.

Claim 33 (withdrawn): The system of claim 30, wherein the relationships identified are stored in a system database and the system further includes a query module that allows a user to access information about the implicit relationships.

Claim 34 (withdrawn): The system of claim 30, wherein the knowledge discovery engine evaluates relationships using one or more statistically bounded network models.

Claims 35-44 (canceled)

Claim 45 (previously presented): The system of claim 1, further comprising a scanning module comprising a scanner for scanning printed information and generating a data source from the printed information.

Claim 46 (canceled).

Claim 47 (previously presented): The system of claim 1, further comprising a computer readable storage medium for storing the Object-Relationship Database.

Claim 48 (original): The system of claim 47, further comprising a client/server architecture wherein at least two functions of the system are distributed in a server and at least one client computer connectable to the network.

Claim 49 (original): The system of claim 48, wherein the system comprises a program for accessing one or more data sources.

Claim 50 (previously presented): The system of claim 49, wherein the Object-Relationship Database is dynamic, and adds new data objects from the one or more data sources to the database.

Claim 51 (previously presented): The system of claim 50, wherein the system recomputes an data object network when new data objects are added from the one or more data sources.

Claim 52 (previously presented): The system of claim 1, wherein the system further comprises:

- an engine for monitoring recomputation results; and
- wherein the system re-evaluates relationships between data objects.

Claim 53 (original): The system of claim 48, wherein the database is downloadable to the at least one client computer.

Claim 54 (previously presented): The system of claim 48, wherein the database is stored in memory of the server computer and the at least one client can access the database by communicating with the server.

Claim 55 (previously presented): The system of claim 1, wherein the system further comprises a results and analysis database, wherein the results and analysis database comprises: information relating to a query regarding an object relationship and results of the query.

Claim 56 (previously presented): The system of claim 55, wherein the results and analysis database further comprises a record comprising information relating to an interpretation of the results.

Claim 57 (original): The system of claim 55, wherein the results and analysis database further comprises data validating the results.

Claim 58 (previously presented): The system of claim 1, wherein the system further comprises an application program for executing a computer code comprising instructions for ranking relationships.

Claim 59 (previously presented): The system of claim 58, wherein the computer code includes instructions for a system processor to generate a linear or nonlinear grouping of individual ranking factors.

Claim 60 (previously presented): The system of claim 59, wherein each individual ranking factor is associated with a coefficient that weights each data object.

Claim 61 (previously presented): The system of claim 60, wherein the coefficient is determined by one or more of the following factors: the source of the data source; the date on which the data source was published; the ratio of the observed frequency of co-occurrence of data objects to the expected frequency of co-occurrence of data objects; the name of the author associated with the data source; the name of the institution associated with the data source; and the frequency of co-occurrence of data objects in different data sources.

Claims 62-67 (canceled)

Claim 68 (previously presented): The system of claim 61, wherein the frequency of co-occurrences of data objects within the data source is determined.

Claim 69 (previously presented): The system of claim 1, wherein the knowledge discovery engine generates a comprehensive network of relationships to identify the implicit relationships.

Claims 70-108 (canceled)

Claim 109 (currently amended): A computer program embodied on a computer readable storage medium for accessing domains of information comprising:

a code segment adapted to contain a source of data comprising one or more domains of information;

a code segment adapted to maintain an Object-Relationship Database comprising data objects from the one or more domains of information, wherein each data object ~~comprises~~ consists of a noun, a verb, an adjective, an adverb, a phrase, a sentence, a symbol or a numeric character; and

a code segment adapted to contain a knowledge discovery engine where relationships between two or more data objects within the Object-Relationship Database are: (a) identified as a direct relationship or an indirect relationship, (b) retrieved, (c) grouped into categories selected from the group consisting of a positive effect, a negative effect, a physical association and a logical association, (d) ranked based on a relative strength of the identified relationship, (e) filtered by lexical processing, and (f) numerically evaluated to identify previously unknown relationships between an object query and the data objects using an average observed-to-expected ratio ~~where no link previously existed.~~

Claim 110 (previously presented): The computer program of claim 109 further comprising a code segment for creating the Object-Relationship Database (ORD) comprising:

a code segment adapted to compile one or more database data objects;

a code segment adapted to group the information in the one or more databases into an object-relationship database;

a code segment adapted to construct a database of lexical variants from one or more databases;

a code segment adapted to scan the object-relationship database with the database of lexical variants to add synonyms; and

a code segment adapted to assign each data object a unique numeric ID and storing adirectional relationships by lowest ID first; and

a code segment adapted to check the object-relationship database for errors.

Claim 111 (canceled)

Claim 112 (withdrawn): A data structure comprising a plurality of candidate compounds for evaluation generated by a method comprising the steps of:



obtaining an object-relationship database generated from a data source comprising one or more databases of information; and

processing one or more objects using a knowledge discovery engine to recognize meaningful relationships from a data source comprising the steps of:

identifying one or more co-occurrences of objects from the data source; generating a comprehensive network of relationships; and

storing the shared relationships evaluated by one or more statistical bounded network models, wherein a query is performed on the shared relationships to identify novel relationships from the comprehensive network of relationships.

Claims 113-126 (canceled)

Claim 127 (currently amended): A method for numerically assigning importance to relationships comprising the steps of:

identifying one or more co-occurrences of data objects within one or more topical sets in an Object-Relationship Database comprising the data objects from one or more domains of information, wherein each data object ~~comprises~~ consists of a noun, a verb, an adjective, an adverb, a phrase, a sentence, a symbol or a numeric character;

evaluating the probability that one or more co-occurrences of data objects represents a meaningful relationship within one or more topical sets;

assigning an importance to each relationship based on the evaluated probability; and wherein the foregoing steps are executed using a system comprising:

a processor linked to the Object-Relationship Database, wherein the processor executes a knowledge discovery engine where relationships between two or more data objects within the Object-Relationship Database are: (a) identified as a direct relationship or an indirect relationship, (b) retrieved, (c) grouped into categories selected from the group consisting of a positive effect, a negative effect, a physical association and a logical association, (d) ranked based on a relative strength of the identified relationship, (e) filtered by lexical processing, and (f) numerically evaluated to identify previously unknown relationships between an object query and

the data objects using an average observed-to-expected ratio ~~where no link previously existed~~, and

a user interface linked to the processor.

Claim 128 (previously presented): The method of claim 127, wherein the importance is a function of the number of times two data objects are co-mentioned within the one or more topical sets in the Object-Relationship Database.

Claim 129 (previously presented): The method of claim 127, wherein the importance is a function of the textual distance between two data objects.

Claim 130 (original): The method of claim 127, wherein the importance is based on an external measure of the topical set, wherein the external measure is selected from the group consisting of importance, relevance, and quality.

Claim 131 (original): The method of claim 127, wherein the importance includes an evaluation of one or more co-occurrence patterns over time.

Claim 132 (previously presented): The method of claim 127, wherein a natural language processing engine is used to identify one or more co-occurrences of data objects.

Claim 133 (original): The method of claim 127, wherein contextual information within the topical set is used to assign importance.

Claim 134 (previously presented): The method of claim 133, wherein contextual information within the topical set is used to assign a nature to the relationship.

Claim 135 (original): The method of claim 127, wherein importance is veracity.

Claim 136 (withdrawn): A method of finding implicit relationships comprising the steps of  
identifying one or more objects directly related to one or more query objects as a set  
of directly related objects;

identifying one or more objects related to the set of directly related objects as a set of implicitly related objects; and

quantitatively evaluating each implicitly related object to determine a probability that it shares a meaningful relationship with the query object by deriving an importance score and a veracity score.

Claim 137 (withdrawn): The method of claim 136, wherein quantitative evaluation further comprises a probability that a statistically similar relationship could be observed by chance.

Claim 138 (withdrawn): The method of claim 136, wherein a formula (6) according to

$$P(A \leftrightarrow B_1^n) = \sum_1^n 1 - \left(1 - \frac{K_A}{Nt}\right) * \left(1 - \frac{K_{B1}^n}{Nt}\right) \text{ is used.}$$

Claims 139-150 (canceled)

Claim 151 (previously presented): A computer program product stored on a computer readable storage medium comprising program code for executing functions of the system of claim 1.

Claims 152 (canceled)